Draft Memo

From: James Smith, USDA Forest Service. Northeastern Research Station
To: Thomas D. Peterson, CCS
Cc: Alison Bailie, Peter and Pat Kuch, Michael Lazarus, CCS
Subject: AZ Forestry Carbon Numbers
Date: Monday, April 25, 2005

I've attached my current draft of stocks and flux based on survey data - that is, there's no adjustment for land use change or any products information here. These are still drafts, and are based on the current state of inventory data and FORCARB. Additional changes are likely to be related to the lower productivity/reserved lands (total-forest minus timberlands). The basic issue with these lands, which I still need to work on, is the change in how they were defined, so there may be some reason to adjust acres or tons of carbon on those acres. (The definition of the woodlands was slightly different in each of the 3 surveys.)

The stock and flux values in the attached spreadsheet are the state-level totals consistent with the national numbers we've supplied to EPA the last couple years (http://yosemite.epa.gov/oar/globalwarming.nsf/content/ResourceCenterPublicationsGHGEmissions.html). A negative flux indicates a net increase in forest carbon. The current forcarb projections are that NM is sequestering forest carbon and AZ is losing live tree carbon but sequestering carbon in the nonliving pools. Note that changes in area have a strong influence on these estimates. Also note that each state has two complete surveys, and AZ has data on 30% of the plots in the 3rd survey. Of course, all this can change slightly depending on how the woodlands are adjusted. Also not e that I've split out the National Forest estimates from other forest in terms of stocks but pooled them for flux totals.

The soils numbers are based on the assumptions that (1) soil carbon is solely a function of forest type, and (2) carbon changes instantly if forest type changes. These are not exactly true, but without additional information it's one possible estimate. An alternative is to assume type change has a very small effect - effectively zero.

I've not located any timber harvest information for AZ or NM other than the TPO values at http://ncrs2.fs.fed.us/4801/fiadb/rpa_tpo/wc_rpa_tpo.ASP. I assume these are newer versions of the datasets used by Birdsey and Lewis. I'll generate products estimates from these tables with a method similar to that applied to Maine last year.

These values are very different from those in Birdsey and Lewis. This is probably no surprise to Tom since it's more or less the same story as we saw for Maine last year. The Birdsey and Lewis estimates represent FORCARB values from 1998 (or maybe 1999), and are based on RPA forest summary datasets for 1987, 1992, and 1997, which are not always separate surveys. FORCARB has evolved since then (with a goal of continuous improvement), and we are using distinct FIA survey data. Some of the changes in

FORCARB over the last year or so have been to improve resolution for individual states.

Compare the values in B&L Table 4 with the current stock estimates; the largest differences are in the biomass (mostly live trees) and soil. The tree equations have changed, but the real difference in biomass is probably related to carbon on woodlands. The basic approach for soils is the same (between B&L and the current); the only difference is that the forest-type-specific averages used by Birdsey and Lewis were generally much higher than our current data.

When county level NRI data are available, they will help resolve some of the differences in FIA definitions of woodlands - or maybe make a more consistent estimate between surveys. They may also provide a partial estimate of type changes (this may be useful for soils... if net change of smaller units is closer to gross change than net change of aggregate values).

I'll be happy to answer any questions about the current draft values, etc.

(See attached file: AZNMcarbon_draft_25Apr05.xls)

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